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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,589	03/25/2004	Hiroyuki Arai	16359-006001 / 721/SM/toh	4607

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EXAMINER	
CHOW, YUK	
ART UNIT	PAPER NUMBER
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/808,589	ARAI ET AL.	
	Examiner	Art Unit	
	Yuk C. Chow	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9-12,15-20* is/are rejected.

7)☒ Claim(s) *3, 4, 6, 7, 8, 13, 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :05/18/2006, 11/13/2006, 11/09/2004.

DETAILED ACTION

Drawings

1. Applicant is advised to provide a copy of the reference "Display Technologies Series" indicated on [0030].

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "pulse detecting unit", "level detecting unit" and "switching unit" in claims 7, 8 must be shown or the features canceled from the claim. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. Figure 9 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 3, 4, 6 and 7 are objected to because they include reference characters "TP" and "TL" which are not enclosed within parentheses. Appropriate correction is required.

Reference characters corresponding to elements recited in the detailed description of the drawings and used in conjunction with the recitation of the same element or group of elements in the claims should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. See MPEP § 608.01(m).

Claim Rejections - 35 USC § 112

4. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Subject mater "the detecting unit" in last 3 lines was not clearly regarded as claimed invention "a pulse detecting unit" or "a level detecting unit".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 5, 6, 9-12 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoekstra (US Patent 6,005,538) in view of Benton (US Patent 5,515,390).

As to claim 1 and 2, Hoekstra teaches a driving circuit for a vacuum fluorescent display for a pulse driving a filament of VFD with a pulse voltage (Fig. 3). And DC-rectified voltage produced by integrating with pulse voltage (col. 3 line 40-col. 4 line12)

However, Hoekstra's driving circuit does not teach a detection unit outputs a signal for notifying of an abnormal state of the pulse voltage.

Benton teaches an error detection circuit for electro-optic display including VFD. It generates an error warning (Fig. 1 (7a)) when an incorrect electrode potential is detected (col. 3 line 12-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate error detection circuit of Benton into VFD driving circuit of Hoekstra for ensuring the accuracy of the display. It would be essential for the operator to read the number correctly, because failed segments could go undetected and could be read as different number to reader. For example, if the center segment of

a seven-segment display fails, the driving signal to display for producing the digital display of the number "8" becomes a "0".

4. As to claim 5 and 6, Hoekstra teaches a driving circuit for a vacuum fluorescent display in claim 1 above. Hoekstra also teaches a DC-rectified voltage (Fig. 8 (interval A)) produced by integrating the pulse voltage (Also see col.3 line 40 - col.4 line12)

However, Hoekstra does not teaches a detection unit outputs a signal indicating that the time to measure the level of pulse voltage is equal or longer than a predetermined time period.

Benton teaches an error detection circuit, which can test the driver as well as the display's electro by comparing the electrode potential difference while varying the test period (Fig. 2(Ts)), the test period (Fig. 2(Ts)) can be made from 1 ms to 10 ms (Col 3 line 47 – Col 4 line 43).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply fault-detecting scheme of Benton into Hoekstra's driving circuit for vacuum fluorescent display, such error detection scheme provides checking of the input data or driver levels to the display electrode, and also achieves the requirement to the accuracy and integrity of the display electro, such arrangement further improves robustness of the display.

5. As to claims 9 -12, Hoekstra teaches a driving circuit (Fig. 3) for a vacuum fluorescent display in claim 1 above.

However, Hoekstra differs from the claimed invention in that driving circuit is not taught to necessarily be "a semiconductor integrated circuit".

Benton teaches an integrated circuit (Fig. 4(4), 74HC646 CMOS devices) with the switching element externally connectable for generating the pulse voltage (Fig 4(23, 27), also see Col 5 line 19-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a commercially available semiconductor in Benton instead of the custom driving circuit in Hoekstra, because commercial IC is usually well known for its reliability. Also the advantage of using standard IC over application specific IC is lower cost and shorter time for testing, therefore, shorten the time to the market.

6. As to claims 15 - 20 Hoekstra teaches a driving circuit for a vacuum fluorescent display for a pulse driving a filament of VFD with a pulse voltage (Fig. 3 (26)), a grid driving unit (Fig. 3(46)), and a segment driving unit (Fig 3(42)).

However, Hoekstra does not teach a control unit for controlling output of one of the driving unit, based on the detection signal.

Benton teaches a control unit (Fig 4(7)) which control the high impedance resistor (Fig 4(10)) based on the detection signal (Col 3 line 28 – 46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a control unit of Benton with Hoekstra's driving circuit because there would be a need for a new controller when there is a change or integration in the circuit elements.

7. Claims 3, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoekstra (US Patent 6,005,538) in view of Benton (US Patent 5,515,390) as applied to claim 1 above, and further in view of Moon (US Patent 6,926,573).

As to claims 3 and 4, Hoekstra and Benton teach a driving circuit for a vacuum fluorescent display and the error detecting unit in claim 1 above.

However, Hoekstra and Benton do not teach a pulse detecting unit for detecting a signal as the number of the pulses per predetermined time period.

Moon teaches a signal having the level of the pulse voltage is fixed, and the number of the pulses could be varied within a predetermined time period (see Fig 10 signal (1) and (2)).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the signal in Moon's into Benton's error detecting scheme. The number of pulses and level of pulse voltage could both considered as design variables for inputting an error-detecting unit, since they could be at abnormal state of the pulse voltage.

Allowable Subject Matter

1. Claims 7, 8, 13, 14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

None of the references cited (Hoekstra, Benton and Moon) teaches applicant's claimed invention "*a pulse detecting unit..., a level detecting unit..., and wherein, the detecting unit is switchable...*".

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuk C. Chow whose telephone number is 571 270-1544. The examiner can normally be reached on 8-6 M-TH E.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on 571 270-1550. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

YCC

AMARE MENGISTU
SUPERVISORY PATENT EXAMINER